EPA
United States
Environmental Protection
Agency

Office of Technology Operations and Planning

Video TeleConferencing (VTC)
Over
Internet Protocol (IP)

Test Plan

ORD/NHEERL
Directors meeting
over IP

DRAFT
June 2005

OFFICE OF ENVIRONMENTAL INFORMATION

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1.0 - Purpose

This test plan document was developed to identify the "Who, What, When and How" of a proposed Video Teleconferencing (VTC) over IP trial. The request to conduct a trial was submitted by Cliff Moore or the Office of Research and Development (ORD) to Liza Hearns and Jason Kaldani of the Office of Environmental Information (OEI)

2.0 - Objectives

The following objectives have been identified:

1. Conduct Larry Reiter's NHEERL Directors staff meeting via IP based video conferencing systems to determine if acceptable video quality can be achieve when connected to T1 attached sites. (Corvalis, Newport, Duluth, Grosse Ile, etc.)

2. If the objective above is successful, ORD may consider a "Technology Refresh" of the VTC equipment currently in place throughout the ORD sites to allow additional or enhanced functionality, improved usability and improved space utilization within conference facilities.

3. ORD desires to migrate from the current predominantly switched ISDN based wide area network connectivity to a predominantly IP based wide area network connectivity.

4. Allow OEI to test and evaluate Tandberg's latest IP VTC infrastructure products (Gateway, Gatekeeper, MCU and Border controller), evaluate impact of VTC traffic at T1 attached sites and testing of an RFC 2547 overlay network.

3.0 – Prerequisites

The prerequisites are anticipated to ensure successful completion of the testing described in this document:

1. Approval from the appropriate staff for connection of the Tandberg demo equipment to the EPA network (Tandberg Standard Configuration Document is in review currently)

2. Appropriate tasking of required contractors in the VTC, Network and security areas

3. Appropriate ORD staff to sign the evaluation agreement for the demo equipment

4.0 – Test Plan

This section will provide a basic outline of the steps required to perform a live test that will facilitate the above stated objectives:

1. OEI and ORD to establish a working relationship centered on meeting the objectives stated in this document providing project leadership, management review and contractor tasking and vendor liaison management.

2. ORD to work with Tandberg to facilitate a 30-day demo of the required Tandberg equipment as indicated in this document.

3. All involved parties to collaborate on the review and approval of this test plan document.

4. A technical interchange meeting is conducted to allow STG and CSC contractor staff to review details of planned testing activities.

5. Tandberg to ship required equipment to the locations indicated in Appendix A (Target date for equipment arrival at sites is July 15th)

6. OEI contractors (STG, Inc) to work with individual sites to connect Tandberg demo gear to existing Multimedia and NTSC TV displays.

7. STG staff in RTP will connect and configure the MCU, Gatekeeper, Gateway devices at the 4201 building in RTP, NC

8. STG staff will assist in the connection and configuration of the Tandberg Border Controller in the DMZ to allow testing of the Tandberg firewall traversal technology.

9. One or more multi-site test call will be conducted by STG to ensure operational status of the demo equipment (target date July 20 – 22)

10. A test NHEERL directors meeting will be conducted during the week of July 25th – 29th with VTC and IP network staff monitoring the call for quality and network impact. (RTP and 6 sites to be included in initial test call)

11. Additional multi-site calls to be conducted at different times and with different participants as required to ensure complete testing under real-world scenarios, e.g. point to point call over a test RFC 2547 overlay network, IP to ISDN gateway calls, IP VTC firewall traversal, etc. (A complete list of tests to be conducted will be developed as more information becomes available and after the completion of the technical interchange meeting)

12. STG will compile the test results and experiences and amend this test plan document for distribution to all involved parties.

5.0 – Key staff

Organization	Name - Position
EPA/OEI	Jason Kaldani – Nat'l VTC manager Liza Hearns – Branch Chief /Desktop and Collaboration Lynn Conger – Branch Chief/Hosting and Storage
EPA/ORD	Cliff Moore – ORD/ORMA Ken Laws – NHEERL IT lead
STG, Inc Contractors	April Stanley – Supervisior-VTC Operations Steve Juris – Manager – Technical Services Shea Sivell – VTC Specialist Mike McClain – Telecom Analyst
CSC, Inc Contractors	TBD
Tandberg	Patty Trimbath – Account Rep John Atkins – Engineer

6.0 – Issues / Outstanding questions

Responses to the below issues will be added as additional information is made available

- Is there a desire / requirement for the ORD staff in Cinncinati to participate and receive demo equipment?
  (Response – No, NHEERL program staff is present in Cincinnati and ORD expressed a desire to minimize demo equipment requested from Tandberg)

- Is there a desire / requirement for the ORD staff located in Chapel Hill, NC (Rebecca Calderon) to participate?
  (Response – Initial testing is not to include this site, focus on distant T1 attached sites)

- Is there a desire / requirement for the ORD staff in the Reproductive Toxicology Facility (RTF) located in RTP, NC (Sally Darney) to participate
  (Response – Not a high priority and if desires could use the Tandberg 1500 located in same building in John Sykes's office)

- Will the recently purchased and installed Tandberg 6000 MXP located in near Craig Hammel (RRB Room 41107) be involved in the test?
  (Response – Yes, The install in RRB 41107 includes a Nucraft Media Wall with dual Plasma screens and would be an ideal system to have DC based ORD staff (Cliff or Craig) participate in the testing)

- Are some of the sites and or staff involved in this test better suited for an Personal "In Office" VTC system rather than a conference room based system (e.g. Russell Kreis in Grosse Ile, MI) for privacy or convenience reasons?
  (Response – Possibly, more discussion is required. No personal VTC system will be included in the demo request to Tandberg)

7.0 – Technical Issues

7.1 IP video (H.323) infrastructure equipment (Gateway, Gatekeeper, MCU and TMS) will be installed at the STG office facility located at 79 TW Alexander Drive, Building 4201 in RTP, NC.

- Full T3 (45meg) connectivity exists between this facility and the NCC
- All equipment will be on the 134.67.103 subnet to allow traffic monitoring (No other equipment or traffic will be present on that subnet at the time of testing)

7.2 IP Address requirements include:

- Five Static IP addresses on the 134.67.103 network for the (H.323) infrastructure equipment (Gateway, Gatekeeper, MCU, TMS and management console)

- One static IP address and a 100Meg Ethernet port will be required for each of the locations that will receive demo equipment
  RTP-Room B301, Narragansett, Grosse Ile, Gulf Breeze, Duluth, Corvalis and Newport.

7.3 SNMP traffic – The Tandberg Management Suite (TMS) is a software application that will reside on a workstation in the 4201 building on the 134.67.103 network and is used to manage the Tandberg VTC systems. The TMS system and the VTC endpoints need to exchange SNMP traffic and traps for full functionality.

7.4 Firewall Traversal – A Border Controller device will be included in the demo gear to allow traversal of EPA's firewalls to facilitate IP VTC communications with a party outside the EPA enterprise. This Border Controller is intended to be installed in the DMZ located at the NCC.

7.5 RFC 2547 – This emerging protocol could be implemented within the existing EPA WAN to create a logically separate "Overlay" network that offers significant benefits for

transportation of delay and quality intensive traffic (Video and Voice). The RFC 2547 would allow traffic to travel between selected sites without traveling through the NCC in RTP, NC, reducing latency and improve the ability to monitor and prioritize the traffic.

Appendix A

NHEERL – IP VTC
Test site information

Appendix A - Requirements Summary

	Location	Equipment required	Shipping address	Displays to be used with new Tandberg	Tech Contact VSA	Fed Contact
1	RTP, NC EPA main Campus Rm B301 Larry Rieter	**T6000** **Tandberg Demo Pool**	US EPA Mail code B305-01 109 TW Alexander Drive RTP, NC 27711 Attn: Larry Rieter Room B310F	Existing cart mounted TVs monitors used with the PolyCom 970 system	Jesse Mabellos 919-541-3743	
2	Corvalis, OR Thomas D. Fontain	**T6000** **Tandberg Demo Pool**	USEPA ORD Western Ecology Division 200 S.W. 35th Street Corvallis, OR 97333-4902 Attn: Heather Privatsky	Existing cart mounted TVs monitors used with the PolyCom 970 system	Lonnie Haines 541-753-4753	Heather Privasky 541-753-4488
3	Newport, Or	**T880 MXP** **Tandberg Demo Pool**	USEPA Environmental Effects Research Laboratory Coastal Ecology Branch - WED/ORD 2111 S.E. Marine Science Drive Newport, OR 97365-5260	Existing cart mounted TVs monitors used with the PolyCom 970 system	Bryan Coleman 541-867-4039	Heather Privasky 541-753-4488
4	Duluth, MN Janet Keogh	**T880 MXP** **Tandberg Demo Pool**	USEPA Environmental Effects Research Laboratory Mid-Continent Ecology Division/ORD 6201 Congdon Boulevard Duluth, MN 55804	Existing cart mounted TVs monitors used with the PolyCom 970 system	Rita Marrow 218-529-5050	Rod Booth 218-529-5040
5	Grosse, Ile, M Russell Kreis	T880 MXP Recently installed OSWER unit	USEPA Large Lakes Research Station/ORD USEPA Region 5 Emergency Response # 1 9311 Groh Road Grosse Ile, MI 48138-1697	Wall mounted Plasma display	Robert Buckley 734-692-7662 Mike Mullin 734-692-7616	

	Location	Equipment required	Shipping address	Displays to be used with new Tandberg	Tech Contact VSA	Fed Contact
6	Gulf Breeze, FL William Benson	**T6000 MXP** **Tandberg Demo Pool**	USEPA Gulf Ecology Division/ORD Sabine Island Drive Gulf Breeze, FL 32561-5299	Existing cart mounted TVs monitors used with the PolyCom 970 system	Larry Williams 850-934-9376	Carl Litzinger 850-934-9216
7	Narragansett. RI	**T880 MXP** **Tandberg Demo Pool**	USEPA Atlantic Ecology Division/ORD 27 Tarzwell Drive Narragansett, RI 02882	Existing cart mounted TVs monitors used with the PolyCom 970 system	Fred Thielig 401-782-3047	Larry Rossner 401-782-3005
Support Sites or other sites that may be involved						
	RTP, NC 4201 Building (STG Office)	**MCU (16X16) (Demo)** **Gatekeeper (Demo)** **Gateway (Demo)** **Border Controller (Demo)** T1000 (Existing)	STG, Inc 4201 TW Alexander Drive Suite 200 RTP, NC 27709 Attn: April Stanley	Existing equipment will be used	April Stanley 919-541-5752 Steve Juris 919-949-1237	Jason Kaldani
	Washington, DC Craig Hammel's conference room	Existing T6000 Installed in RRB - Room 41107	No equipment will be shipped to this site	Existing equipment will be used	Dave Butcher 202-564-6503	Pam Bassford 202-564-6514
	Rebecca Calderon Human Studioes Facility Chapel Hill, NC (UNC)	T1000 – OEI loaner ?	US EPA 104 Mason Farm Road Chapel Hill, NC 27514	None required (Integrated display)	Chris Baffani 919-541-3646	
	Sally Darney Reproductive Toxicology Facility (RTF)	Existing T1500 MXP (J. Sykers Rm 2108)	2525 Highway 54 (Room number) Durham, NC 27705	None required (Integrated display)	John Sykes 919-541-2953	

Appendix B

Display Options for new Tandberg Systems

STG, Inc has included this section to reinforce the need to consider the display technology that will be utilized with any new Tandberg equipment that may be acquired as a result of this test and evaluation.

The new Tandberg MXP series of VTC equipment is based on wide-screen (16:9 aspect ratio) format and offers "Dual screen emulation" allowing the existing large bulky cart mounted dual monitor arrangement to be replaced with a single large screen Plasma, LCD or projector.

This will allow ORD to eliminate virtually all the "clutter" and floor space used by the current VTC units.

The costs identified in this appendix are rough estimates and significant discussion needs to be conducted to "drill down" to the level of detail required to allow to a specific configuration and cost for each ORD site.

Display Options #1
42” wall mounted Plasma for Tandberg 880 MXP VTC system

Small wall mounted shelf to hold Tandberg unit above plasma display

Tandberg 880MXP VTC unit
- Wide screen capable
- DVI output for digital video
- Integrated codec and camera

42” wall mounted Plasma Display
- Wide screen (16:9)
- Side mounted speakers
- Adjustable wall mount bracket
- Add-in card to support DVI interface
- Supports dual screen emulation
- Supports picture outside Picture (POP)

Option #1 - Approximate costs:

Tandberg 880MXP base unit	$6.521
Tandberg Natural Presenter	$1,633

	$8,154.
Panasonic TH-42PHD9UY Plasma	$3,400
Side mount speakers	$350
Wall mount for plasma	$450
DVI card for plasma	$150
Wall mount for T880	$100

	$4,450

This option would be suitable for small and medium sized conference rooms (6 – 10 people seated at table) and would replace the existing bulky cart based TV monitors

Note the above prices as market estimates and is intended to provide a rough order of magnitude for an appropriate wide screen (16:9) capable display that fully leverages the abilities of the Tandberg MXP product

Display Options #2
50” wall mounted Plasma for Tandberg 880 MXP VTC system

Small wall mounted shelf to hold Tandberg unit above plasma display

Tandberg 880MXP VTC unit
- Wide screen capable
- DVI output for digital video
- Integrated codec and camera

50” wall mounted Plasma Display
- Wide screen (16:9)
- Side mounted speakers
- Adjustable wall mount bracket
- Add-in card to support DVI interface
- Supports dual screen emulation
- Supports picture outside Picture (POP)

Option #2 - Approximate costs:

Tandberg 880MXP base unit	$6.521
Tandberg Natural Presenter	$1,633

	$8,154.
Panasonic TH-50PHD9UY Plasma	$4,300
Side mount speakers	$350
Wall mount for plasma	$450
DVI card for plasma	$150
Wall mount for T880	$100

	$5,350

This option would be suitable for medium sized conference rooms (10 - 18 people seated at table) and would replace the existing bulky cart based TV monitors

Note the above prices as market estimates and is intended to provide a rough order of magnitude for an appropriate wide screen (16:9) capable display that fully leverages the abilities of the Tandberg MXP product

Display Options #3
Ceiling mounted Projector for Tandberg 880 MXP VTC system

Wall mounted speakers

Wall mounted manual projection screen in 16:9 wide screen format (Size based on conference room size)

Tandberg 880MXP VTC unit
- Wide screen capable
- DVI output for digital video
- Integrated codec and camera

Small wall mounted shelf to hold Tandberg unit to the right or left of the screen.

Ceiling mounted projector
- Native wide screen (16:9)
- 2200 ANSI Lumens
- Adjustable image size
- Built-in DVI interface
- Supports dual screen emulation
- Supports picture outside Picture (POP)

Option #3 - Approximate costs:

Tandberg 880MXP base unit	$6.521
Tandberg Natural Presenter	$1,633

	$8,154.
Sanyo PLV-70 projector	$4,500
Projection screen	$450
Wall mounted speakers/amp	$250
Wall shelf for T880	$100

	$5,350

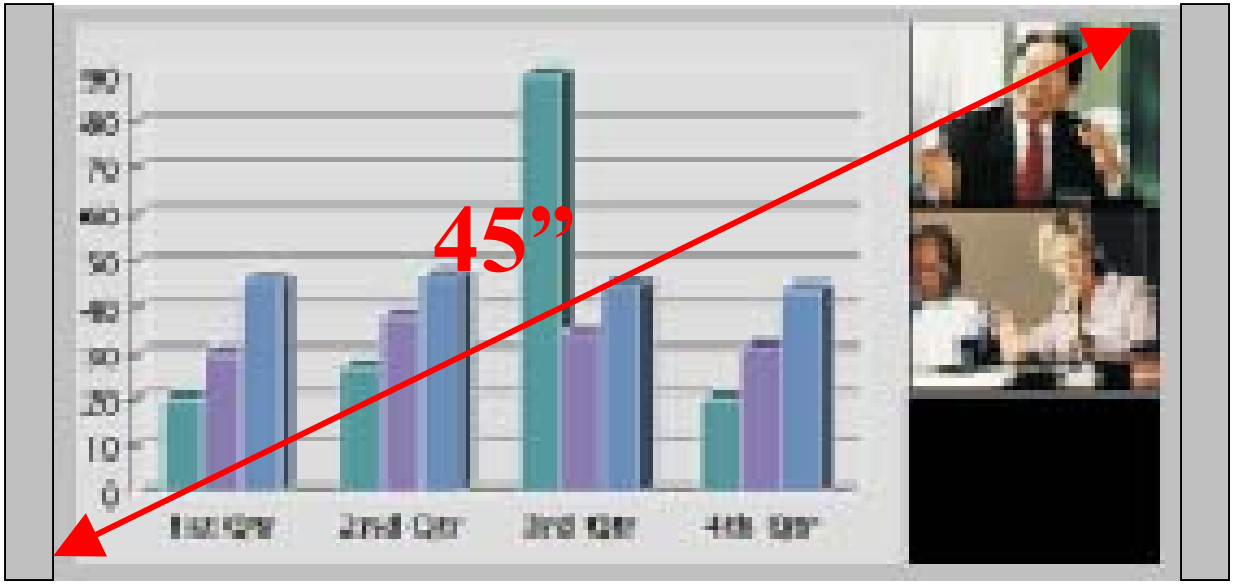
This option would be suitable for medium to large sized conference rooms (15 – 25 people seated at table) or where a large image is desired and would replace the existing bulky cart based TV monitors

Note the above prices as market estimates and is intended to provide a rough order of magnitude for an appropriate wide screen (16:9) capable display that fully leverages the abilities of the Tandberg MXP product

Display Options #4
Large wall mounted LCD for Tandberg 880 MXP VTC system

Small wall mounted shelf to hold Tandberg unit above plasma display

Tandberg 880MXP VTC unit
- Wide screen capable
- DVI output for digital video
- Integrated codec and camera



Option #4 – 45” LCD
Approximate costs:

Tandberg 880MXP base unit	$6.521
Tandberg Natural Presenter	$1,633

	$8,154.
Sharp 45” LCD TV	$5,500
Wall mount for LCD	$450
Wall mount for T880	$100

	$5,350

This option is similar to Option 1 & 2, however an LCD flat panel is used. 45” is currently the largest screen size available and many say that LCDs will eventually replace Plasma displays

This option would be suitable for medium sized conference rooms (10 - 18 people seated at table) and would replace the existing bulky cart based TV monitors.

Note the above prices as market estimates and is intended to provide a rough order of magnitude for an appropriate wide screen (16:9) capable display that fully leverages the abilities of the Tandberg MXP product

Appendix C

Meeting Minutes

This section will be updated with a meeting minutes related to this project to allow for a single document to capture all information as the project proceeds.

ORD/NHEERL Bandwidth Test Plan Meeting Notes
Monday, June 27,2005

Attendees: Ken Laws
Valerie Brandon
Lynn Conger
Jason Kaldani
Cliff Moore
Craig Hammel
Liza Hearns
Steve Juris
April Stanley

Tandberg had confirmed that the shipment off all equipment would be completed by July 15, 2005.

The main purpose is to test the EPA IP network for the biweekly NHEERL's Division Director's meeting coordinated by Larry Reiter. Several tests will be conducted, including mixed IP/ISDN calls, during the week of July 25. The test calls will be conducted between 1 p.m. and 4p.m. EST. This time frame will accommodate both the West Coast and East Coast busy and slow time periods.

The videoconference rooms at each site need to be reserved for installation and testing.

Lynn Conger requested that the first video test be between RTP, Corvallis and Newport. Lynn's group will closely monitor this first test call. These video test calls will be conducted at both 384k and 256k speeds to determine if the difference in speed is apparent at either end.

Five (5) IP addresses in RTP and a total of six (6) IP addresses at the lab sites will be needed for this test. CSC in RTP will coordinate the installation of the IP addresses at all sites. Liza is hoping that the Tandberg SCD is approved by July 25. If not, she will request an extension of IP addresses to the Tandberg waive from John Gibson. Worst-case scenario is that DHCP IP addresses will be used, but long term, static IP addresses are preferred.

Lynn reiterated that this test cannot specifically identify the exact effect of IP video to the EPA network, but spike can be monitored and observed. Steve offered the 134.67.103 subnet reserved for STG for testing purposes. Presently there is no network traffic on this subnet. Lynn suggested a meeting between CSC and STG.

SNMP is needed for the operation of the Tandberg Management System (TMS). The TMS will allow remote monitoring, updates, scheduling and maintenance of all Tandberg video units in the agency. Lynn Conger will discuss approval of SNMP with Security.

Tandberg has offered to provide a Border Controller for this test. Liza has discussed with John Gibson the a need to communicate with agencies and persons outside the agency; Mark Day conducting video calls from his home and the Deaf and HH federal employees through the Federal Relay System. Liza will meet with OSWER to discuss funding for this project.

Steve discussed the RFC 2547 Overlay project and the benefits to Video over IP. Lynn explained that the RFC 2547 Overlay would be used for Voice and Video over IP for priority of service, quality of service (QoS). The application of QoS will needs more tools. Lynn also emphasized that funding is still needed for this project.

Action items:

- Ken Laws and Valerie Brandon will coordinate the installation of the Tandberg video units. (Ensure proper contractor staff, room avaibility, etc)
- STG staff in RTP will begin to compile a list of IP addresses required and specifics related to Ethernet port installations
- Lynn Conger will set up a meeting this week between STG and CSC to discuss roles and responsibilities for this project.
- Ken Laws will setup a meeting for next week with the CSC and STG field site personnel to discuss roles and responsibilities for this project.
- STG will research the VTC bridging service history related to the NHEERL director meeting and provide to EPA